

## **Appendix F**

### **Rocky Flats Site Soil Disturbance Evaluation Procedure**

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## Soil Disturbance Evaluation Process

**Purpose:** The purpose of this Soil Disturbance Evaluation Process is to identify hazards and regulatory requirements so that appropriate work control steps are implemented to mitigate the hazard and/or meet regulatory requirements. The soil disturbance evaluation process is a part of the *Rocky Flats Site Operations Guide* (RFSOG) work planning process (see Section 9.0). This paper provides guidance on what constitutes a soil disturbance and the items to consider when the work planning process requires that an evaluation be conducted.

**Background:** Soil disturbance means activities that, by design, will penetrate the existing surface by digging, ripping, tilling, or driving rods, stakes, or similar sturdy items (i.e., stronger than a pin flag) to a depth deeper than 6 inches.

This type of disturbance could encounter subsurface infrastructure present in the soil disturbance area, which may create a hazard if severed or penetrated. This type of disturbance may also have remedy performance implications because of the possibility that contaminants could be mobilized and/or physical or institutional controls (ICs) may be involved.

Soil disturbance is prohibited by the Rocky Flats Legacy Management Agreement (RFLMA) ICs (see RFLMA Attachment 2, Table 4), unless conducted in accordance with the Erosion Control Plan (ECP) requirements; disturbance deeper than 3 feet must be approved by the Colorado Department of Public Health and Environment (CDPHE). Soil disturbance activities could impair the functioning of physical controls, treatment systems, and/or monitoring wells or stations. The RFLMA ICs are intended to mitigate the possibility of exposure from access to or mobilization of contaminants that may remain in or under the soil, and preserve various aspects of the remedy to ensure it remains protective of human health and the environment.

Soil disturbance could involve use of tools or equipment that could pose worker or environmental hazards that must be evaluated, such as fugitive dust emissions or destruction of vegetation or habitat. These hazards may also include the potential for people or equipment to come into contact with hazards that are below the soil surface such as buried utilities or remaining infrastructure.

**Evaluation Process and Documentation:** The evaluation is based on a graded approach that considers the area, depth, and location of the disturbance. Any soil disturbance that involves activities prohibited by RFLMA ICs must be evaluated to determine the implementation of the ECP and whether specific regulatory approval is required. The rationale for each IC is discussed below, and the rationale will be considered in applying the graded approach.

After the RFLMA IC evaluation, a hazards evaluation may also be required. The hazards review will consider the following:

- Residual contamination
  - Closeout reports and former Individual Hazardous Substance Site proximity
  - Maps

- Active gas pipeline
  - Map with prohibitions
- Inactive utilities
  - Closeout reports (See RFSOG Appendix D)
  - Maps
- Active utilities
- Results of line locate

Based on known and documented subsurface conditions, experience with construction projects that involved soil disturbance and water monitoring at Rocky Flats, and regulatory requirements, soil disturbance activities that meet the following criteria do not require specific hazards evaluation or mitigation plans:

- Outside of Preble's meadow jumping mouse (PMJM) habitat area
- Outside of wetlands or surface waters
- Does not involve use of excavation or other heavy equipment (e.g., placement of pin flags, placement of erosion control materials, and picking up debris exposed on the surface)
- Total area disturbed is less than 0.5 acre
- Depth is less than 6 inches

The rationale for ICs is contained in the Corrective Action Decision/Record of Decision (CAD/ROD), which specifies:

As part of the selected remedy/corrective action, DOE will institute a series of institutional controls. These controls will extend throughout the Central OU .... In general, these controls are needed so that the assumptions incorporated into the risk assessments for the likely future users (the WRW and WRV) are not violated, and in turn these users do not receive unacceptable levels of exposure to residual contamination. Certain controls are also needed to prevent damage to engineered components of the remedy.

The ICs, objective, and rationale for each are:

1) The construction and use of buildings that will be occupied on a permanent or temporary basis (such as for residences or offices) is prohibited. The construction and use of storage sheds or other, non-occupied structures is permitted, consistent with the restrictions contained in controls 2 and 3 below, and provided such use does not impair any aspect of the response action at Rocky Flats. (*Objective: prevent unacceptable exposures via the indoor air pathway. Rationale: The analysis of the indoor air pathway in the CRA indicated that subsurface VOCs were at levels in certain portions of the Central OU that could pose a risk of unacceptable exposure to the WRW if occupied structures were built in these areas.*)

2) Excavation, drilling, and other intrusive activities below a depth of three feet are prohibited, except for remedy-related purposes and routine or emergency maintenance of existing utility easements, in accordance with pre-approved procedures. *(Objective: prevent unacceptable exposure to residual subsurface contamination. Rationale: Contaminated structures, such as building basements, exist in certain areas of the Central OU, and the CRA did not evaluate the risks posed by exposure to this residual contamination. Thus, this restriction eliminates the possibility of unacceptable exposures. Additionally, it prevents damage to subsurface engineered components of the remedy.)*

3) No grading, excavation, digging, tilling, or other disturbance of any kind of surface soils is permitted, except in accordance with an erosion control plan (including Surface Water Protection Plans submitted to EPA under the Clean Water Act) approved by CDPHE or EPA. Any such soil disturbance will restore the soil surface to preexisting grade. *(Objective: prevent migration of residual surface soil contamination to surface water. Rationale: Certain surface soil contaminants, notably plutonium-239/240, were identified in the fate and transport evaluation in the RI as having complete pathways to surface water if disturbed. This restriction minimizes the possibility of such disturbance and resultant impacts to surface water. Restoring the soil surface to preexisting grade maintains the current depth to subsurface contamination or contaminated structures.)*

4) Surface water may not be used for drinking water or agricultural purposes. *(Objective: prevent unacceptable exposure to local surface water contamination above the terminal ponds. Rationale: While the CRA did not evaluate the risks posed by the use of surface water for drinking or agricultural purposes, the nature and extent of contamination evaluation in the RI showed that certain contaminants were found at levels exceeding standards above the terminal ponds. This restriction reduces the possibility of unacceptable exposures to the future users from this source.)*

5) The construction or operation of groundwater wells is prohibited, except for remedy-related purposes. *(Objective: prevent unacceptable exposure to contaminated groundwater. Rationale: While the CRA did not evaluate the risks posed by the use of ground water for drinking or agricultural purposes, the nature and extent of contamination evaluation in the RI identified areas in the Central OU where groundwater contaminants exceeded water quality standards or MCLs. This restriction reduces the possibility of unacceptable exposures to future users from this source. Additionally, it prevents the disruption of groundwater flow paths so as to avoid impacts to groundwater collection and treatment systems.)*

6) Digging, drilling, tilling, grading, excavation, construction of any sort (including construction of any structures, paths, trails or roads), and vehicular traffic are prohibited on the covers of the Present Landfill and the Original Landfill, except for authorized response actions. *(Objective: ensure the continued proper functioning of the landfill covers. Rationale: This restriction helps ensure the integrity of the landfill covers.)*

7) Activities that may damage or impair the proper functioning of any engineered component of the response action, including but not limited to any treatment system, monitoring well, landfill cap, or surveyed benchmark, are prohibited. *(Objective: ensure the continued proper functioning of engineered portions of the remedy. Rationale: This*

*restriction helps ensure the integrity of other engineered components of the remedy, including monitoring and survey points.)*

The CRA was based on a specific land use, a wildlife refuge. Per the Rocky Flats National Wildlife Refuge Act, the majority of the Site is to have jurisdiction transferred to the U.S. Fish and Wildlife Service (USFWS) for the purpose of becoming a National Wildlife Refuge. The lands retained by DOE, which contain the Central Operable Unit are expected to be managed consistent with the Refuge, unless the needs of the remedy dictate otherwise (See the CAD/ROD Section 9.0). Thus, Legacy Management worker activities that are encompassed within the wildlife refuge worker exposure scenario parameters would entail the same parameters.

**Evaluation Documentation:** When soil disturbance is expected as part of an activity, the determination will be noted in the RFSOG checklist (see RFSOG Appendix H) and a brief discussion of the evaluation (generally 1 to 2 pages) will be documented for Rocky Flats Site Manager review as part of the work approval process (see RFSOG Section 9.0). The discussion may reference design drawings, maps, sketches, RFLMA Contact Records, and so forth to provide information.

The discussion paper will address the following topics:

**Work:** Provide the name of the activity as shown on the Project/Activity Evaluation checklist (form LMS 1005e).

**Reason for soil disturbance:** State briefly why the scope includes a need for soil disturbance.

**Depth of penetration/cut/excavation:** Describe location and amount of soil to be disturbed.

**Material being placed in ground:** If material will be left in the ground, provide brief description.

**IC review:** Note that a review of ICs has been done and provide conclusion.

**Hazard review:** Discuss the types of work hazards expected. Typically, this will mention:

- Remains of infrastructure that might be encountered, and whether it may be contaminated requiring monitoring or controls; and
- Line locate that has been completed, or plans for line locate.

**PMJM areas**—If disturbance is in a PMJM area, discuss USFWS Notification requirements per the Programmatic Biological Assessment (Part II, Section 3.2) or whether consultation is needed.

**Wetlands areas**—If disturbance is in or may impact wetland areas, discuss whether permit requirements must be met.

**Evaluation completed by:** Document who performed the evaluation.

**Additional subject matter expert review (if needed):** Indicate whether other items may need to be considered, such as whether existing line locates are sufficient, or hazard review.

**Site Manager Review:** \_\_\_\_\_

An example of a completed soil disturbance evaluation is included on the following page.

## **Example Rocky Flats Soil Disturbance Evaluation (See RFSOG Appendix F for Criteria)**

**Work:** Construction of collection sump for SPPTS. Note that 2 exploratory excavations were done in the construction area in 2007 and 2008, and this evaluation considers the results of that work and the related RFLMA Contact Records, 2007-03 and 2008-03.

**Reason for disturbance/penetration:** Install SPPTS phase I upgrades in accordance with outcome of RFLMA consultative process.

**Depth of penetration/cut/excavation:** The maximum excavation depths will be approximately 15 to 18 ft bgs. See design drawings for location.

**Material being placed in ground:** Concrete sump and concrete valve vault and vault for solar system batteries. Also includes the necessary plumbing, flow measurement, pump, and electrical power (solar) to support the proper operation and maintenance of the sump.

**IC Review:** IC-2 applies. Work has been approved under CR 2008-08 and CDPHE approved design drawings, on 9/9/08.

**Hazard Review:** Residual Contamination (attach maps if necessary) - The sump excavation is in the vicinity of the former ITPH, also known as building 308D. The building was removed as documented in the *Type 1 Facility Closeout Report for Buildings 308B and 308D* (September 22, 2003) – i.e., no residual contamination. No maps attached.

Groundwater in the vicinity is impacted by the Solar Ponds Plume. Groundwater that is encountered will be collected from the excavation, if necessary. If excessive amounts of groundwater are intercepted in the excavation, the water will either be pumped from the excavation to the surface generally southwest of the SPPTS to allow this water to seep back into the ground, as approved in Contact Record 2008-06, or will be containerized and transported to the SPPTS for treatment (at the discretion of the field crew).

Remains of infrastructure - The closeout report for Building 308D indicates that utilities were disconnected and capped three feet below grade. Sections of pre-existing lines in the area that had been used to transfer water from the ITPH to the TMSTs will be re-used for transfer of collected water to the SPPTS and discharge of effluent from the SPPTS.

Line locate - Line locate was done 9/3/08 by J. McLaughlin.

**PMJM areas** - Yes. Received USFWS approved BO on 9/8/08.

**Wetlands areas** - No.

**Evaluation completed by:** Rick DiSalvo and John Boylan

**Additional SME Review (if needed):** None.

**Site Manager Review:** \_\_\_\_\_